FEMA

Loudoun County, VA Flood Risk Review Meeting:

Leesburg, VA

March 13, 2014

RiskMAP

Increasing Resilience Together

Overview of the meeting

- Risk MAP Program Overview
- Overview of non-regulatory Flood Risk Products and Datasets
- Products of the current project
- Project Timeline
- Work Session

Introductions

- **Risk MAP Project Team**
  - County
  - FEMA
  - Michael Baker International

Risk MAP Program Overview

- **Started in 2009**
- **Risk MAP**
  - Mapping – Flood hazard and risk identification
  - Assessment – HAZUS and other risk assessment tools
  - Planning – Hazard mitigation planning
- **Risk MAP Vision**
  - Deliver quality data
  - Increase public awareness of flood risk
  - Encourage local/regional actions that reduce risk

Risk MAP

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Why We're Here

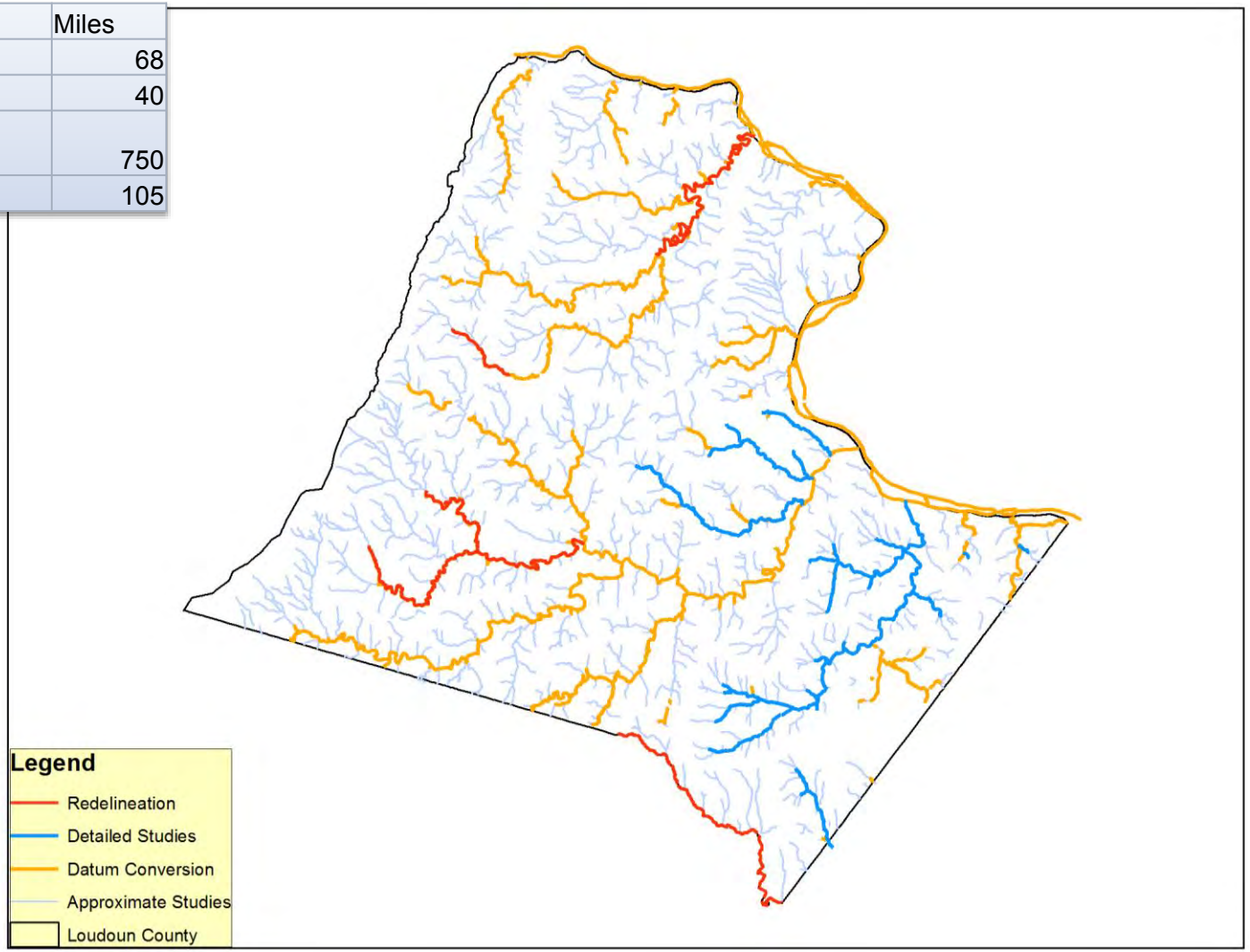
- Discuss about the new Flood Insurance Study in Loudoun County
- Review and discuss the draft Risk MAP non-regulatory products and datasets
- Discuss how the products can inform decisions to reduce flood risk
- Learn how to communicate about flood risk using the products and datasets
- Answer questions

Risk MAP Project Status

- **Where have we been?**
  - County entered into a Cooperating Technical Partner agreement with FEMA to carry out countywide update
  - Participated in Discovery
    - Reviewed flood risk data gathered from across the county
    - Discussed your flooding history, development plans, and operations that impact your flood risk
    - Reviewed your mitigation planning activities and status
    - Finalized your Discovery Map
  - Contracted Michael Baker International to conduct Risk MAP study
  - Analyzed the data
    - Developed hydraulic and hydrologic models and datasets
    - Drafted new maps and products to evaluate flood risk

Extent of Loudoun County Study

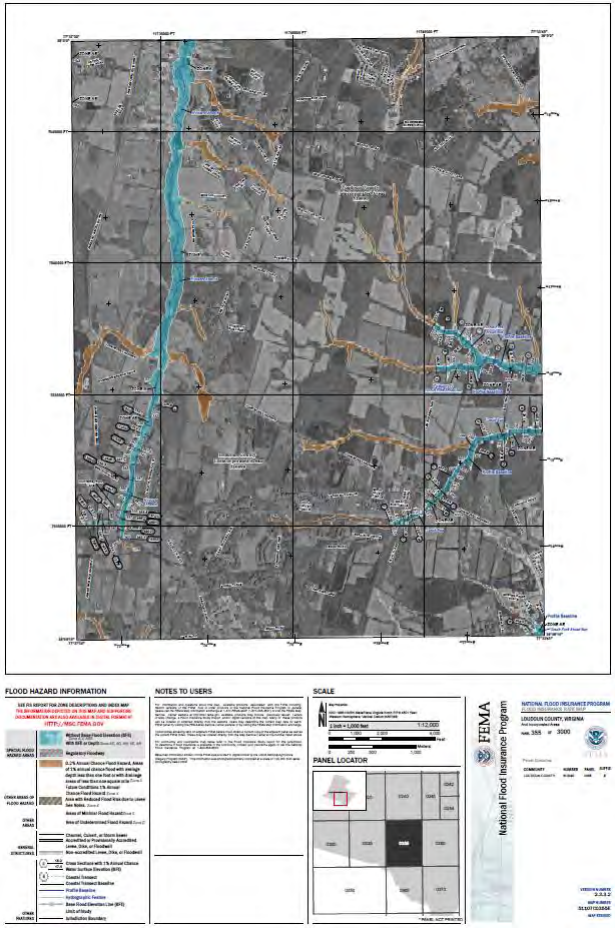
Study Type	Miles
New Detailed Study	68
Redelineation	40
Model Backed Approximate Studies	750
Datum Conversion	105



New Detailed Studies

- Beaverdam Run
- Broad Run
- Cabin Branch No. 1
- Cabin Branch No. 2
- Cattail Branch
- Elklick Run
- Lenah Run
- North Fork Broad Run
- Russell Branch
- South Fork Broad Run
- Sycolin Creek
- Town Branch
- Tributary B to Beaverdam Run
- Tributary D to Beaverdam Run
- Tributary No. 1 to Beaverdam Run
- Tributary No. 1 to Broad Run
- Tributary No. 2 to Broad Run
- Tributary No. 2 to Potomac River
- Tributary No. 3 to Broad Run
- Tributary No. 3 to Elklick Run
- Tributary to North Fork Broad Run
- Tributary to Sugarland Run
- Tributary to Tuscarora Creek
- Tuscarora Creek

Enhanced FIRM and FIS Report



FLOOD INSURANCE STUDY

FEDERAL EMERGENCY MANAGEMENT AGENCY

VOLUME 1 OF 3

LOUDOUN COUNTY, VIRGINIA

AND INCORPORATED AREAS

COMMUNITY NAME	COMMUNITY NUMBER
TOWN OF LEESBURG	510091
LOUDOUN COUNTY UNINCORPORATED AREAS	510090
TOWN OF HILLSBORO	510316
TOWN OF LOVETTSVILLE	510259
TOWN OF MIDDLEBURG	510360
TOWN OF PURCELLVILLE	510231
TOWN OF HAMILTON*	510352
TOWN OF ROUND HILL	510279

*No Special Flood Hazard Areas Identified

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REVISED:

TBD **Draft**

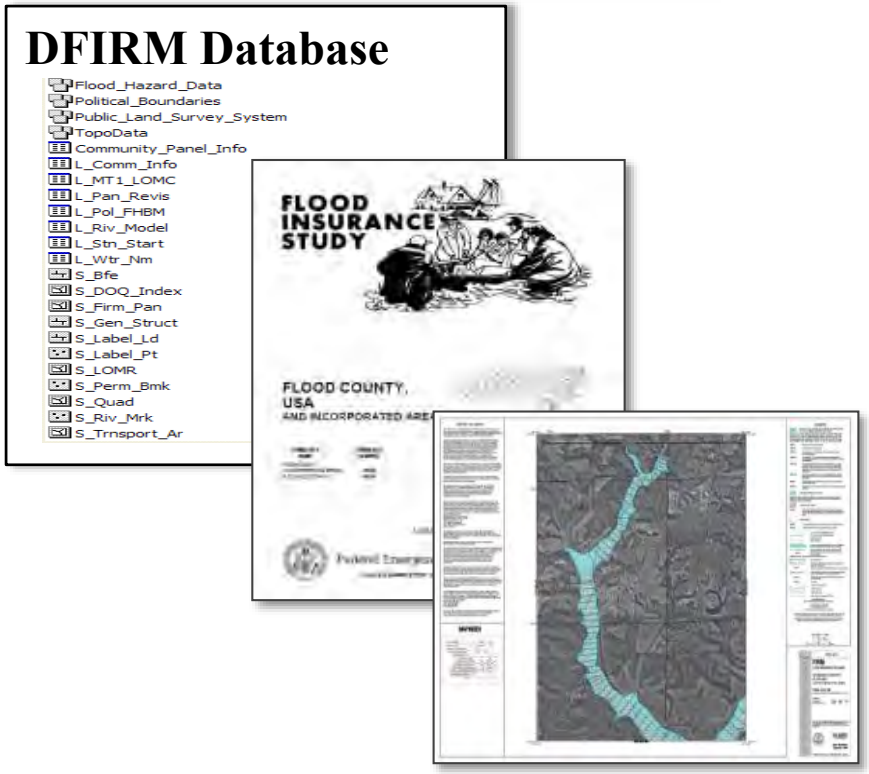
FLOOD INSURANCE STUDY NUMBER
51107CV0001E
Version Number 1.0.0.0

Method of Restudy

- **Detailed Studies**
  - County Specific Regression Equations used for Hydrology
  - Hydraulics
    - Overbank areas – LiDAR
    - Channel and structures – modeled from field measurements
- **Model-backed Approximate Studies**
  - County Specific Regression Equations used for Hydrology
  - Hydraulics
    - Cross-sections generated from LiDAR
    - No structures are modeled

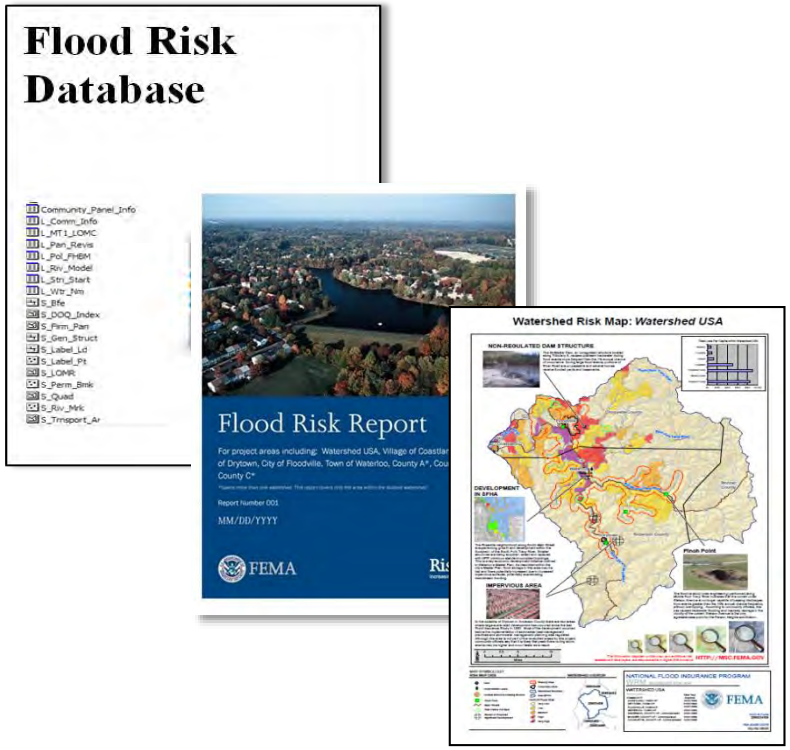
Program Product Comparisons

Traditional Regulatory Products



Traditional products are regulatory and subject to statutory due-process requirements

Non-Regulatory Products

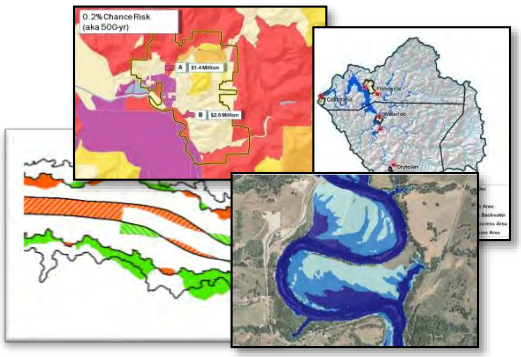


Risk MAP products are non-regulatory and are not subject to statutory due-process requirements

Flood Risk Datasets and Products

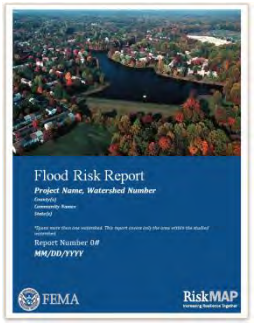
- **Flood Risk Datasets**
  - Changes Since Last FIRM
  - Flood Depth & Analysis Grids
  - Flood Risk Assessment
- **Enhanced Flood Risk Datasets**
  - Areas of Mitigation Interest
  - Others

Flood Risk Products
- Flood Risk Database
- Flood Risk Report
- Flood Risk Map

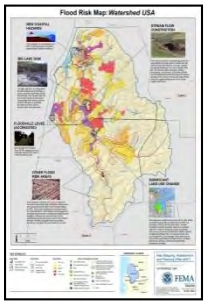


Flood Risk Datasets

Flood Risk Database



Flood Risk Report



Flood Risk Map

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Flood Depth & Analysis Grids

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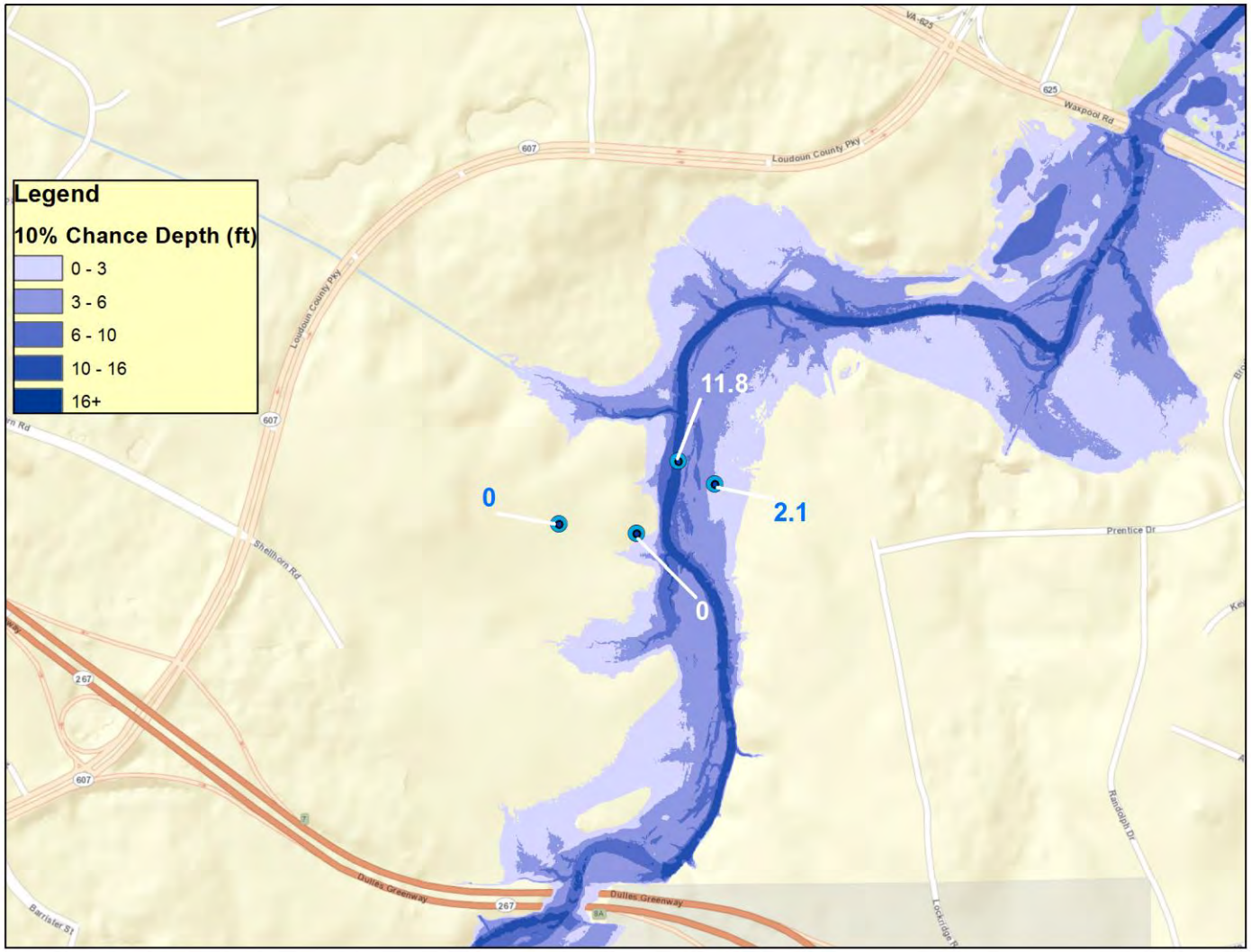
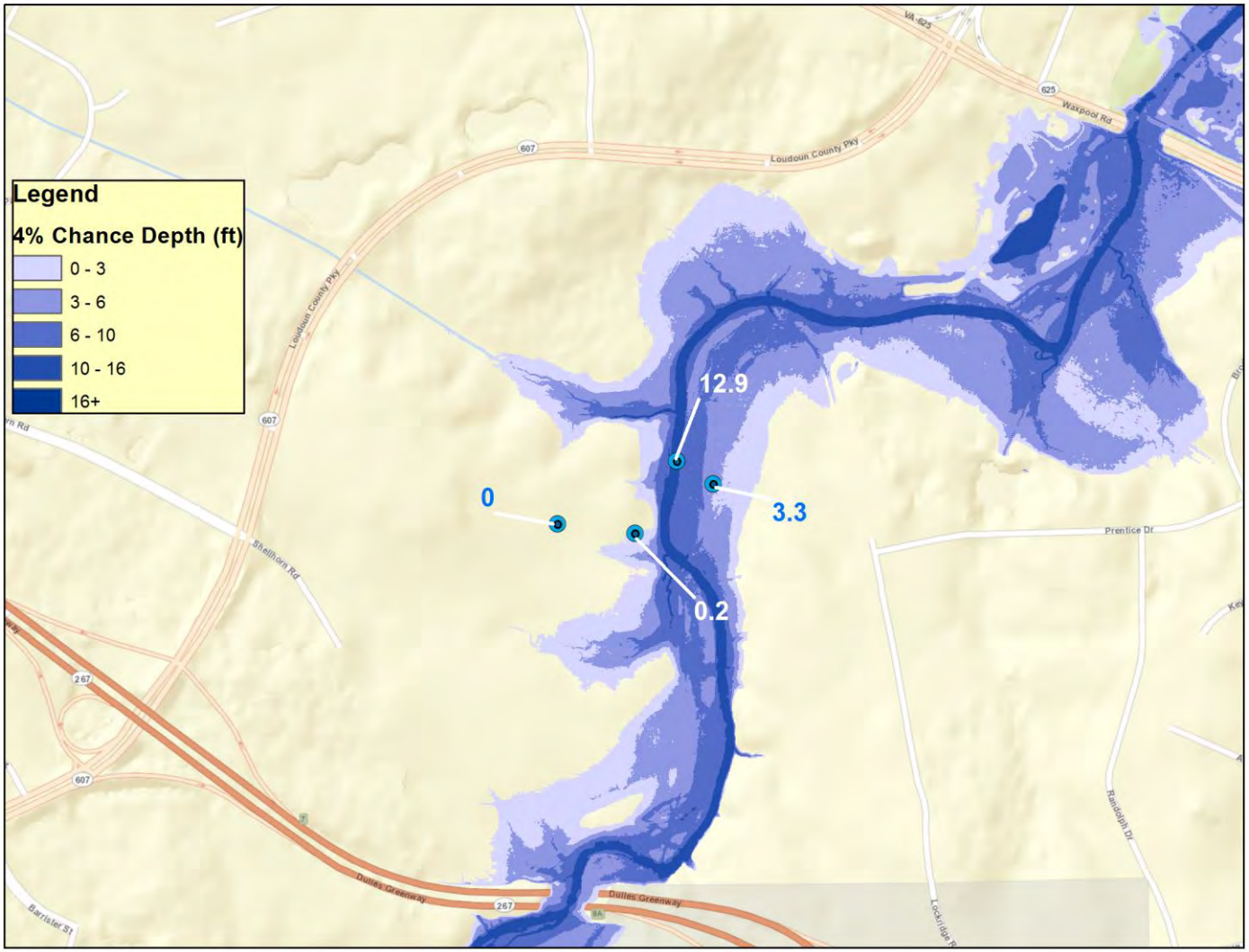
Purpose of Flood Depth & Analysis Grids

- Show flood inundation as a function of an event's magnitude or severity
- Show that flood risk varies within the floodplain
- Demonstrate the risks associated with different flood depths, probabilities, and velocity
- Serve as key inputs to HAZUS Risk Assessment Analyses
- Serve as pre-screening criteria for mitigation project potential (e.g., BCA > 1.0 with positive 10-yr depths)

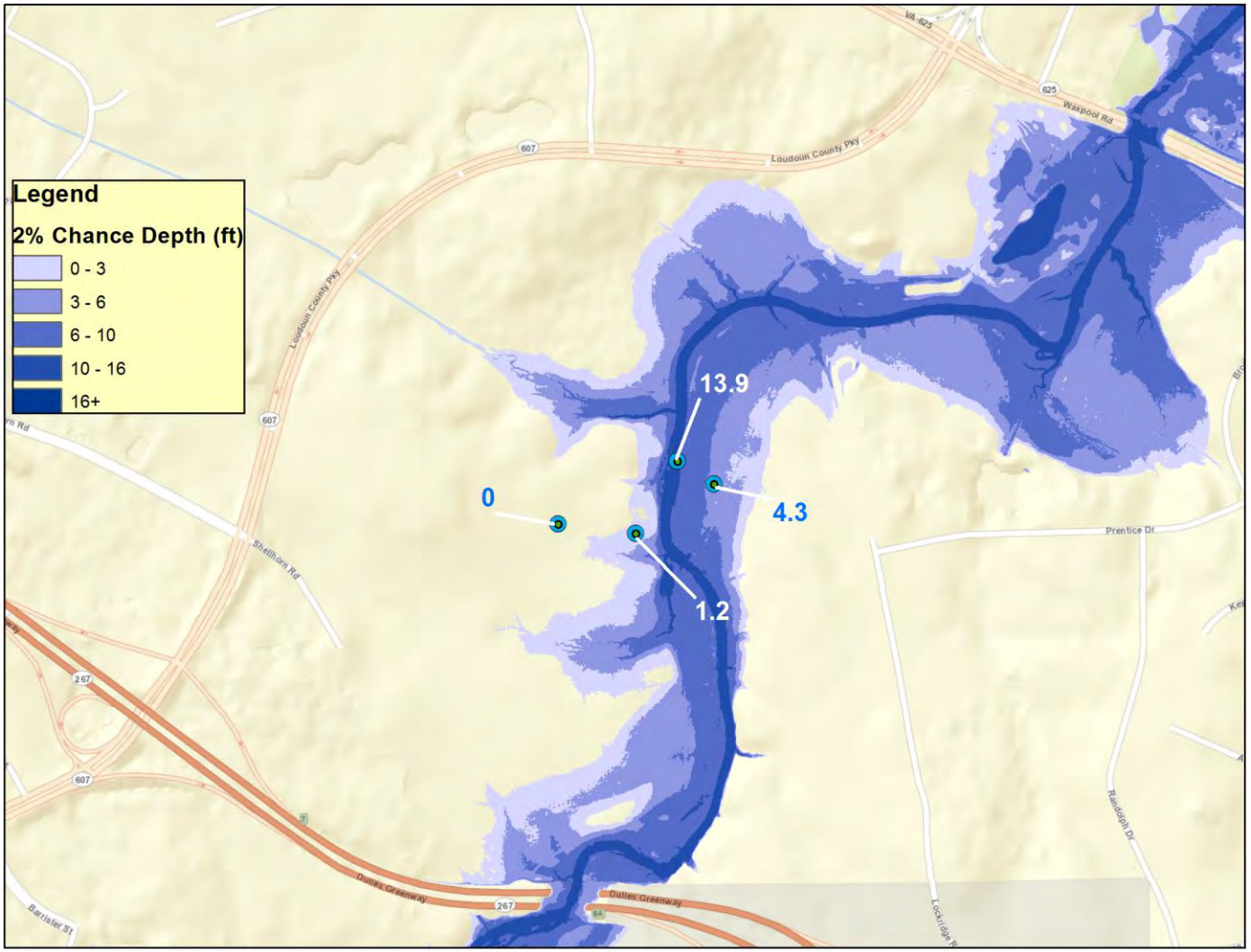
10% Chance Depth Grid



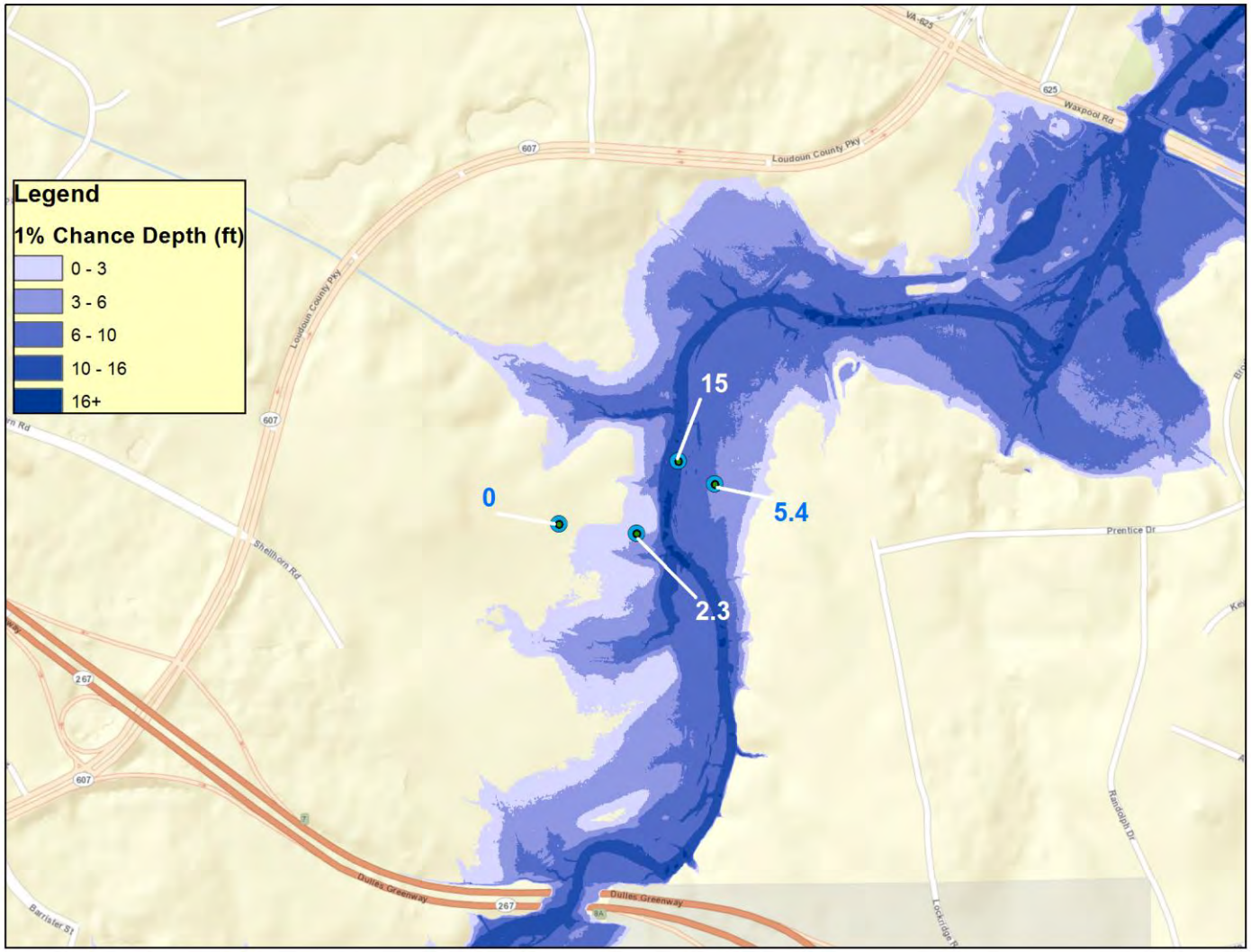
4% Chance Depth Grid



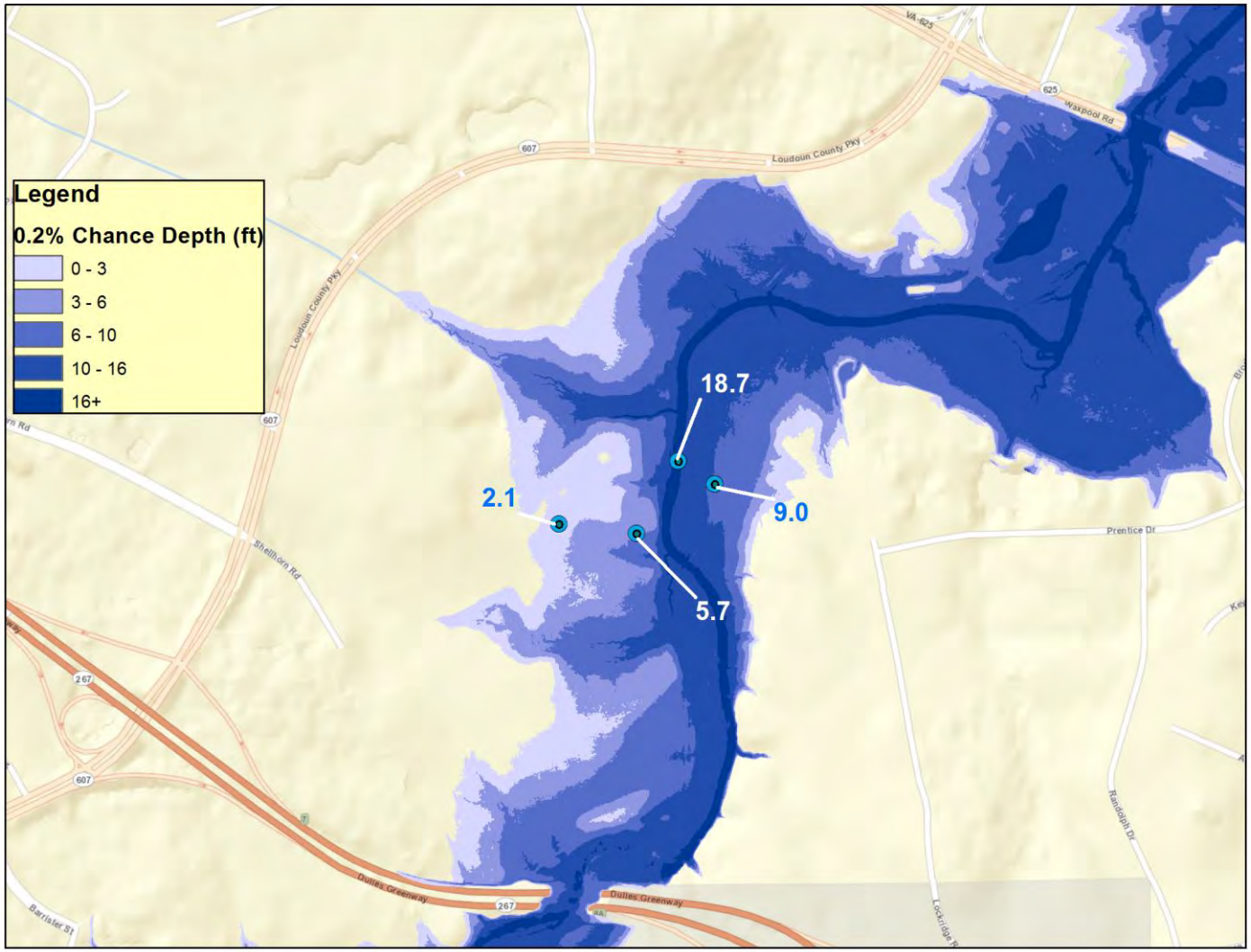
2% Chance Depth Grid



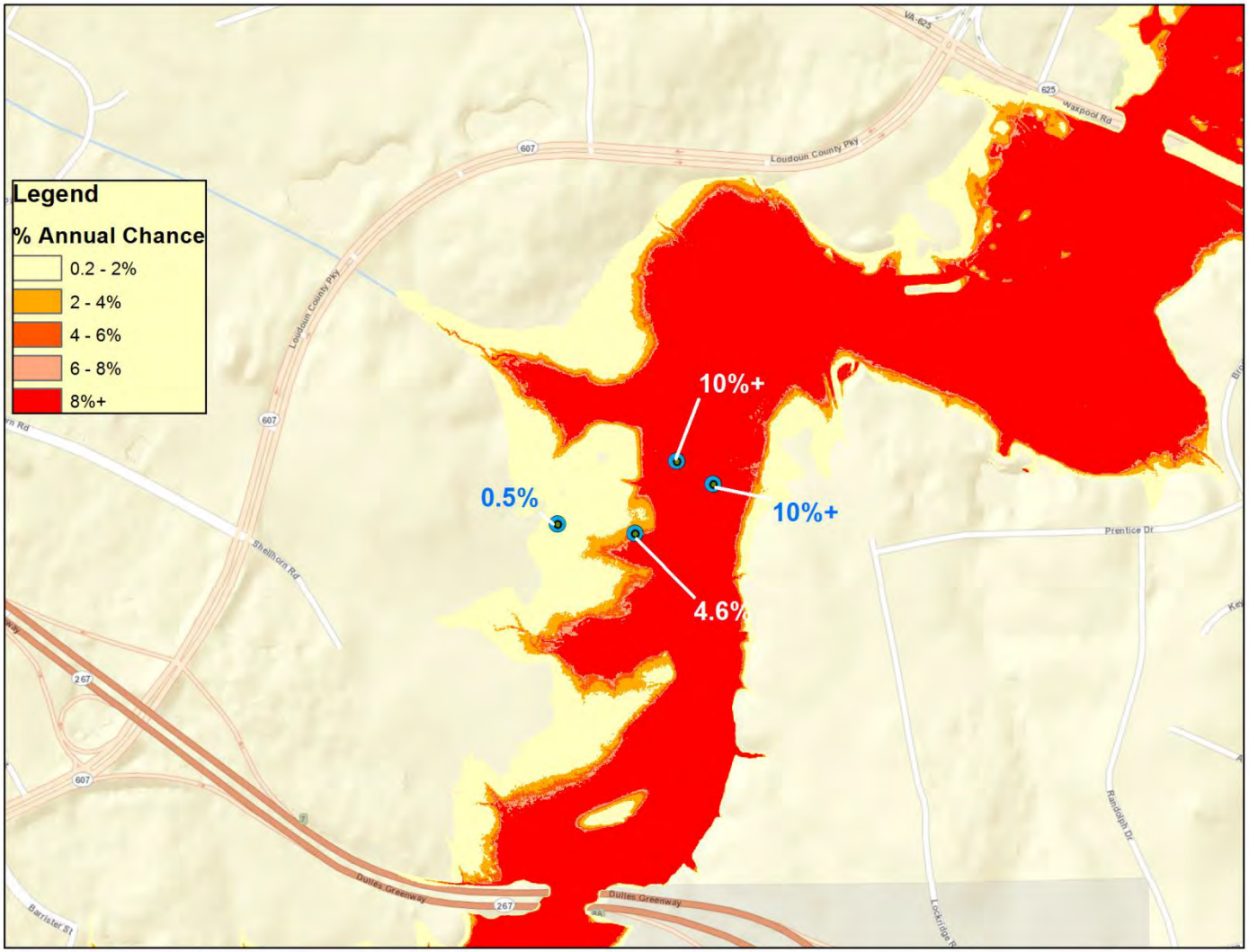
1% Chance Depth Grid



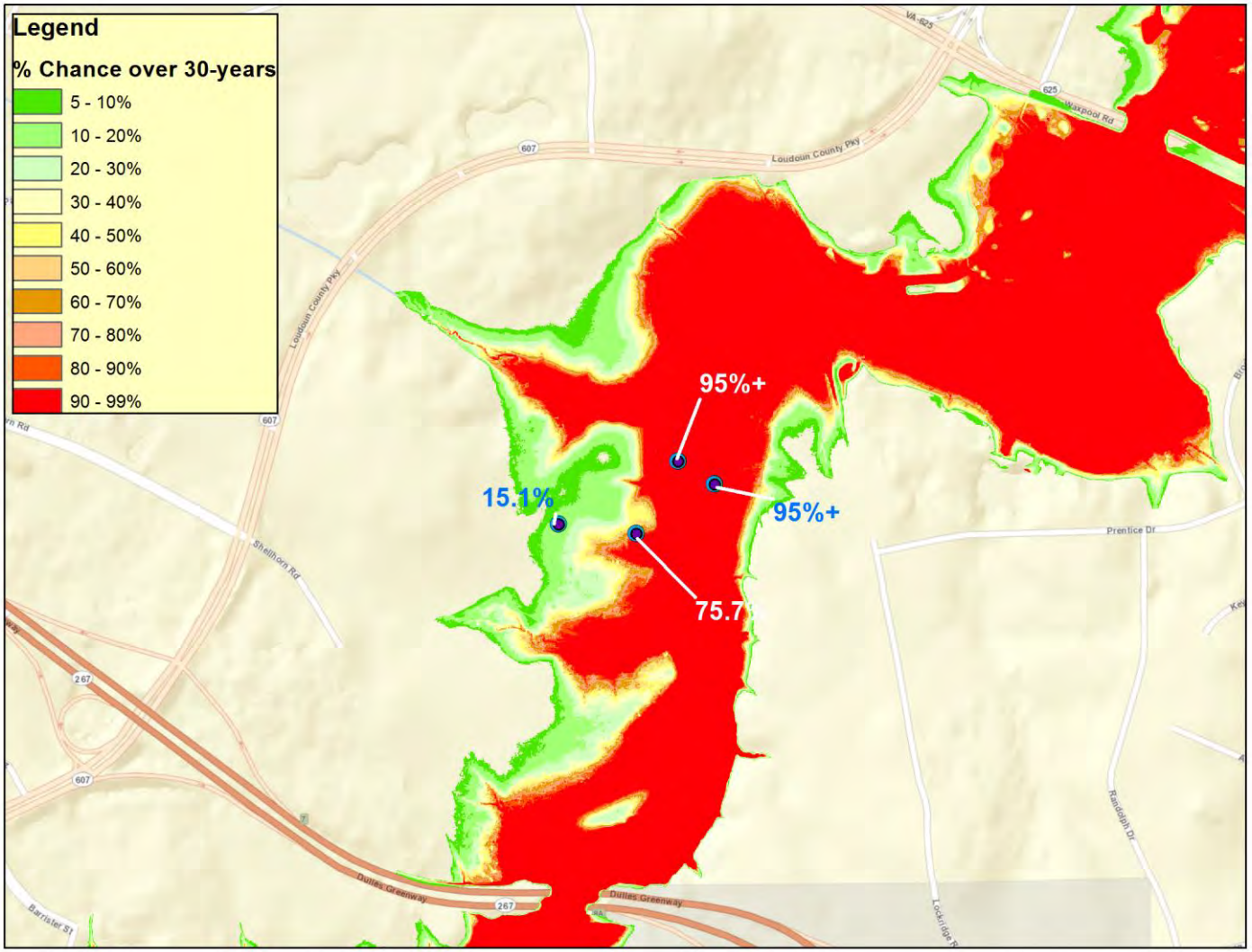
0.2% Chance Depth Grid



Percent Annual Chance Grid



Percent Chance of Flooding Over 30-Year Period Grid



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Flood Risk Assessment Data

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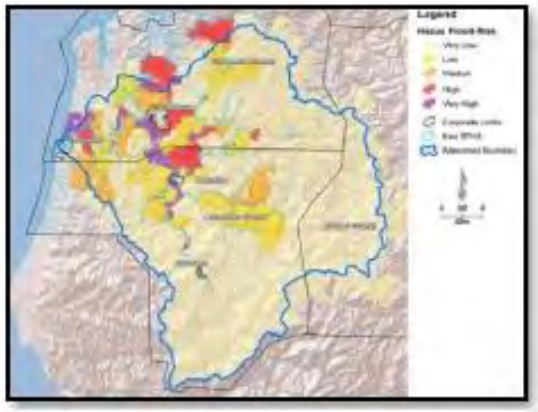
Purpose of Flood Risk Assessment

- **Quantifies flood risk in dollars:**
  - Potential damage severity for different flood frequencies
  - Identify locations with possible cost effective mitigation options
- **Identifies areas of relative flood risk:**
  - Floodprone areas
  - Vulnerable people and property
- **Helps estimate potential losses due to flood risk:**
  - Losses from Average Annualized Loss (AAL) Study
  - Refined losses from new flood study depth grids

Flood Risk Assessment Datasets

- **Flood Risk Assessment Data**
  - 2010 HAZUS Average Annualized Loss (AAL) Study Data
  - Refined HAZUS and Other Risk Analyses Data
  - Composite Data

HAZUS MH



Flood Risk Assessment

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Changes Since Last FIRM Dataset

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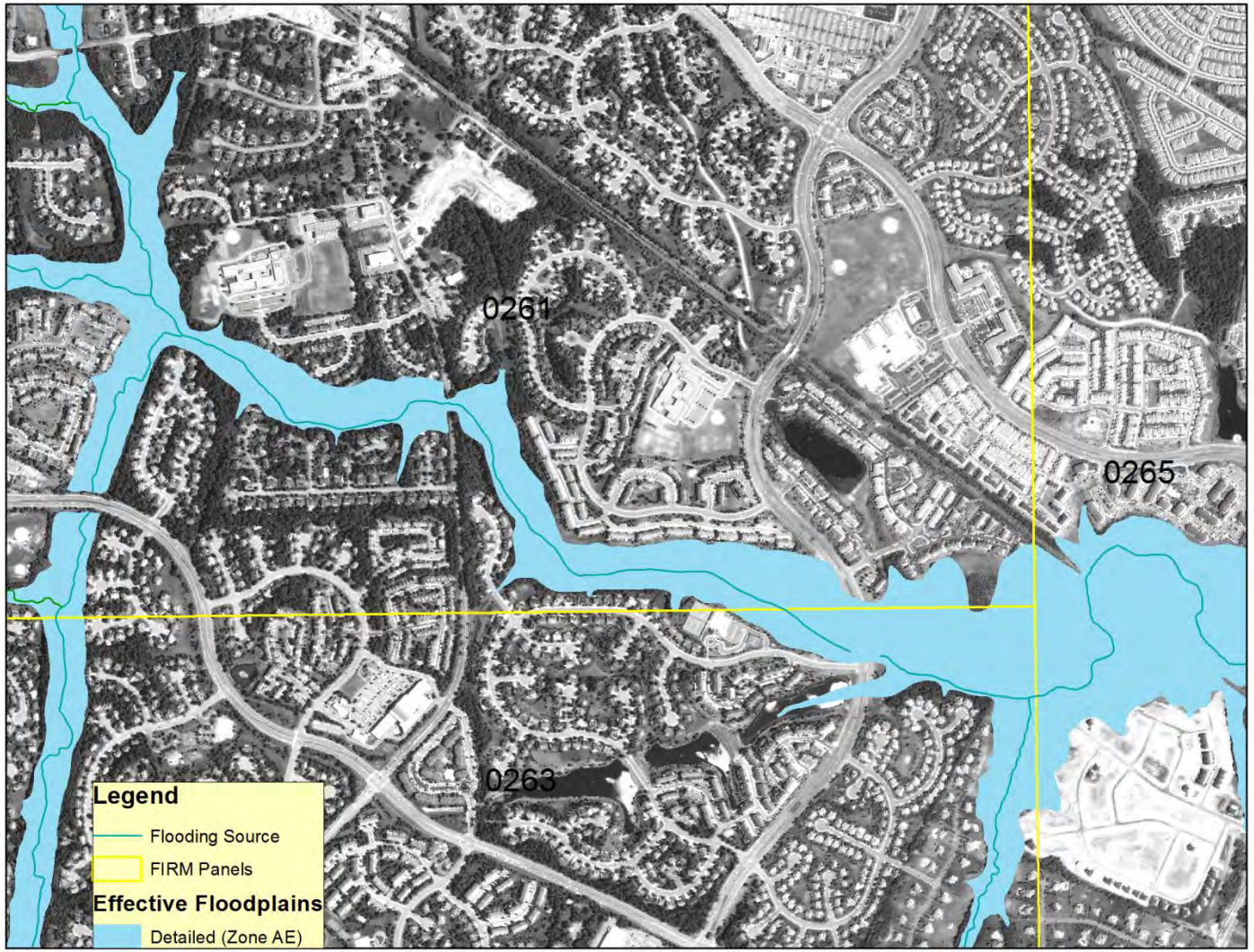
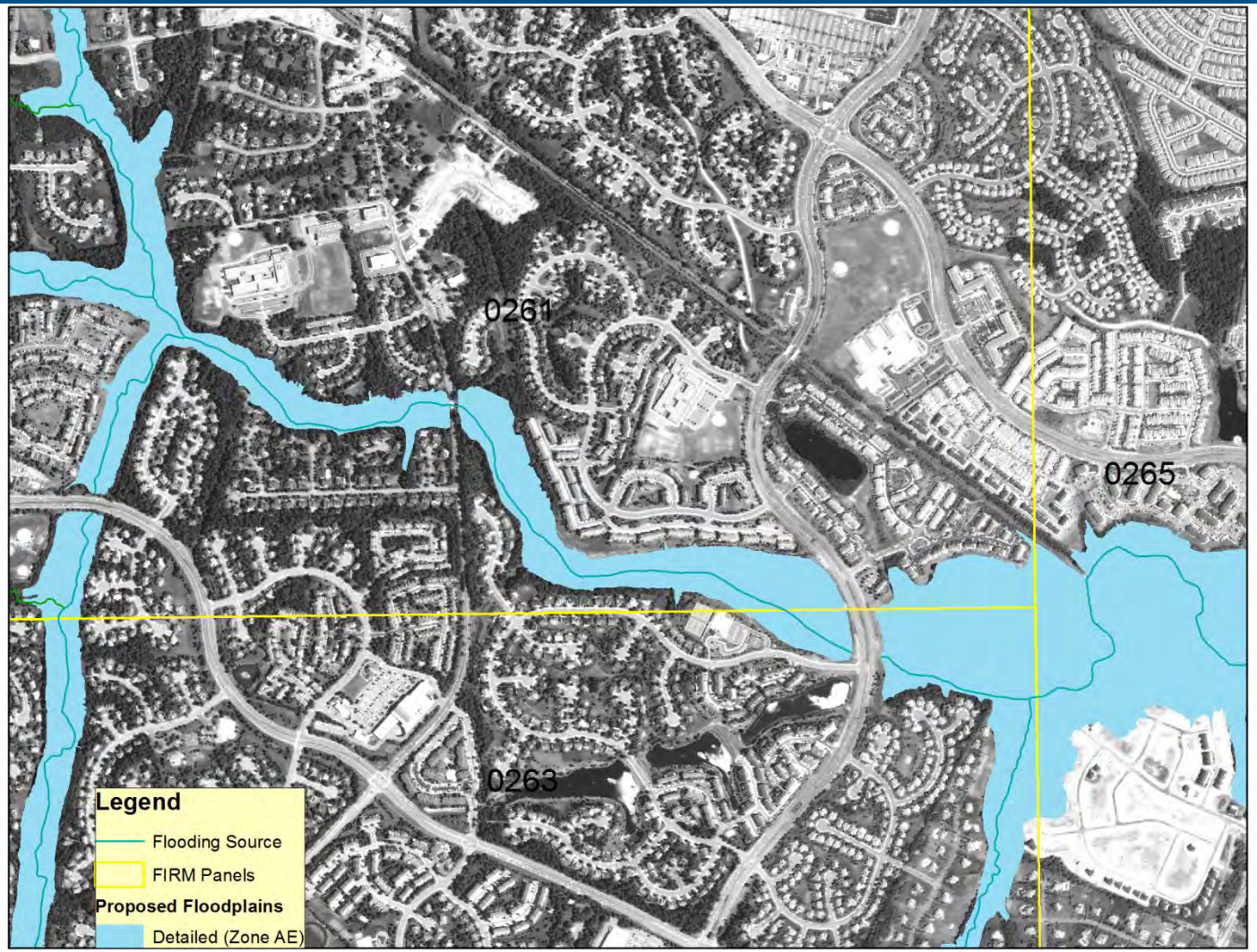
Purpose of Changes Since Last FIRM

- **Identify areas and types of flood zone change:**
  - Compares current effective (previous) with proposed (new) flood hazard mapping. (all inputs must be digital)
  - Flood zone changes are categorized and quantified
- **Offers transparency and answers to:**
  - Where have my flood hazards increased or decreased?
  - Why have my flood hazards increased or decreased?
  - Which communities are subject to new base flood elevations (BFEs) or ordinance adjustments?
- **Provide study/reach level rationale for changes including:**
  - Methodology and assumptions
  - Changes of model inputs or parameters

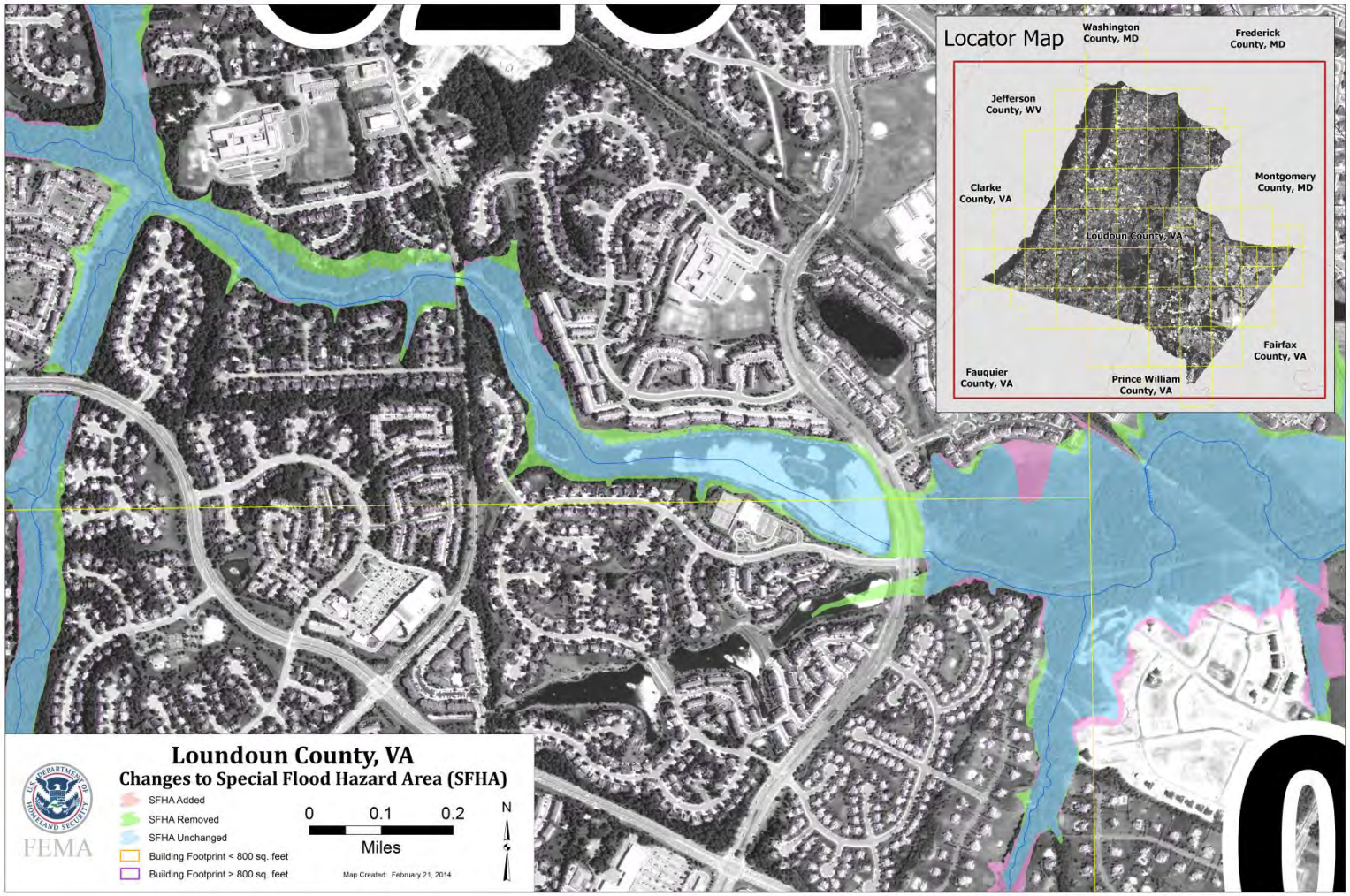
Changes Since Last FIRM



Changes Since Last FIRM



Changes Since Last FIRM



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Areas of Mitigation Interest (Enhanced)

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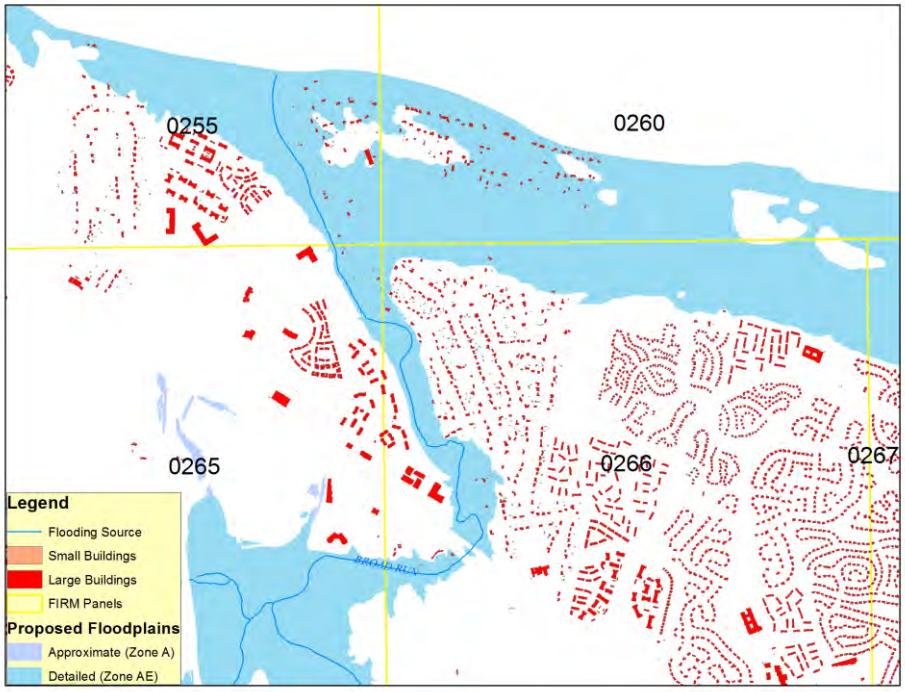
Purpose of Areas of Mitigation Interest

- **Identifies areas that may be affecting flood risk that would benefit from raised local awareness**
- **Raises awareness of local stakeholders within and upstream of the watershed that may be contributing to flood risk and associated interrelationships**
- **Provides input to local mitigation plans**

Areas of Mitigation Interest

Items that may have an impact on the identified flood hazards or flood risks

- **Structures in the floodplain**
  - **At Confluence of Broad Run and Potomac**
- **Home buy-outs**



Areas of Mitigation Interest

- **Examples: channel improvements, home buy-outs, urbanization, non-regulated flood structures, undersized culverts, pinch points, etc.**

Channel improvements and home buy-outs along Aldridge Creek have successfully removed approximately 800 homes from the SFHA and 50 homes from the regulatory floodway.

The Hurricane Creek Watershed Dam No. 11, an unregulated structure located along Killingsworth Cove Branch, impounds approximately 408 acre-ft of water. During large flood events, it is possible that dams such as this one could overtop, creating loss of life and property downstream.

Local Activities That Affect Flood Risk

- **Upcoming activities that may affect your flood risk**
  - Development plans
  - Planned mitigation activities
- **Local activities you currently take to address flood risk**
  - Stormwater management activities
  - Floodplain management activities
  - Daily operations
  - Outreach activities

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Flood Risk Products

- Flood Risk Database
- Flood Risk Report
- Flood Risk Map

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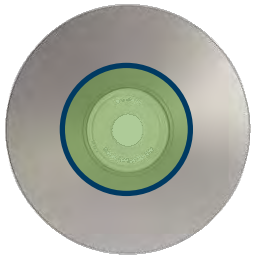
Purpose of Flood Risk Database

- **Primary storage device for flood risk data**
- **Stores data to create:**
  - Flood Risk Report
  - Flood Risk Map
- **Delivered digitally**



Data Delivered

Flood Risk Database (red = enhanced)

Changes Since Last FIRM

- Horizontal Changes and Results
- Structure counts impacted by change

Depth & Analysis Grids

- Depth (10, 04, 02, 01, 0.2 percent chance)
  - About 68 miles of streams with all depth grids
  - About 105 miles of streams with 1 % chance depth grid
- Percent Annual Chance
  - About 68 miles of streams
- Percent 30-Year Grid
  - About 68 miles of streams

Flood Risk Assessment

- Average Annualized Loss – 2010
- Refined Flood Risk Assessment
- HAZUS or Non-HAZUS with improved data/assumptions

Areas of Mitigation Interest

- Areas of Mitigation Opportunity or Awareness

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Flood Risk Report

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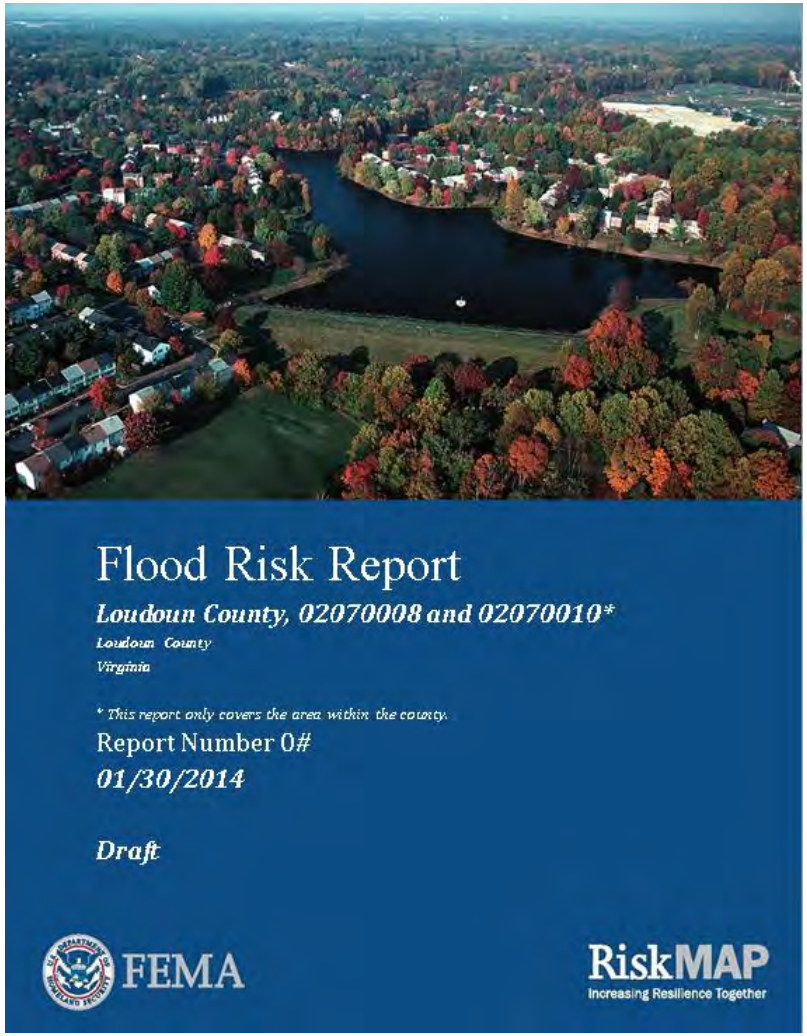
Purpose of Flood Risk Report

- **Increases general flood risk awareness**
  - Risk definitions and causes
  - Risk reduction techniques and mitigation practices
- **Delivers community and project level results**
  - Project results summarized by:
    - Communities
    - Watershed or Project Area
- **Provides information to enhance other efforts**
  - Local hazard mitigation planning
  - Local emergency management planning
  - Local master planning and building development

Flood Risk Report Overview



- **Background**
  - Purpose, methods
  - Risk reduction practices
- **Project results**
  - Changes Since Last FIRM
  - Depth & Analysis Grids
  - Flood Risk Assessment
  - Enhanced analyses
- **Summarized by locations**
  - Communities and watersheds

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Flood Risk Map

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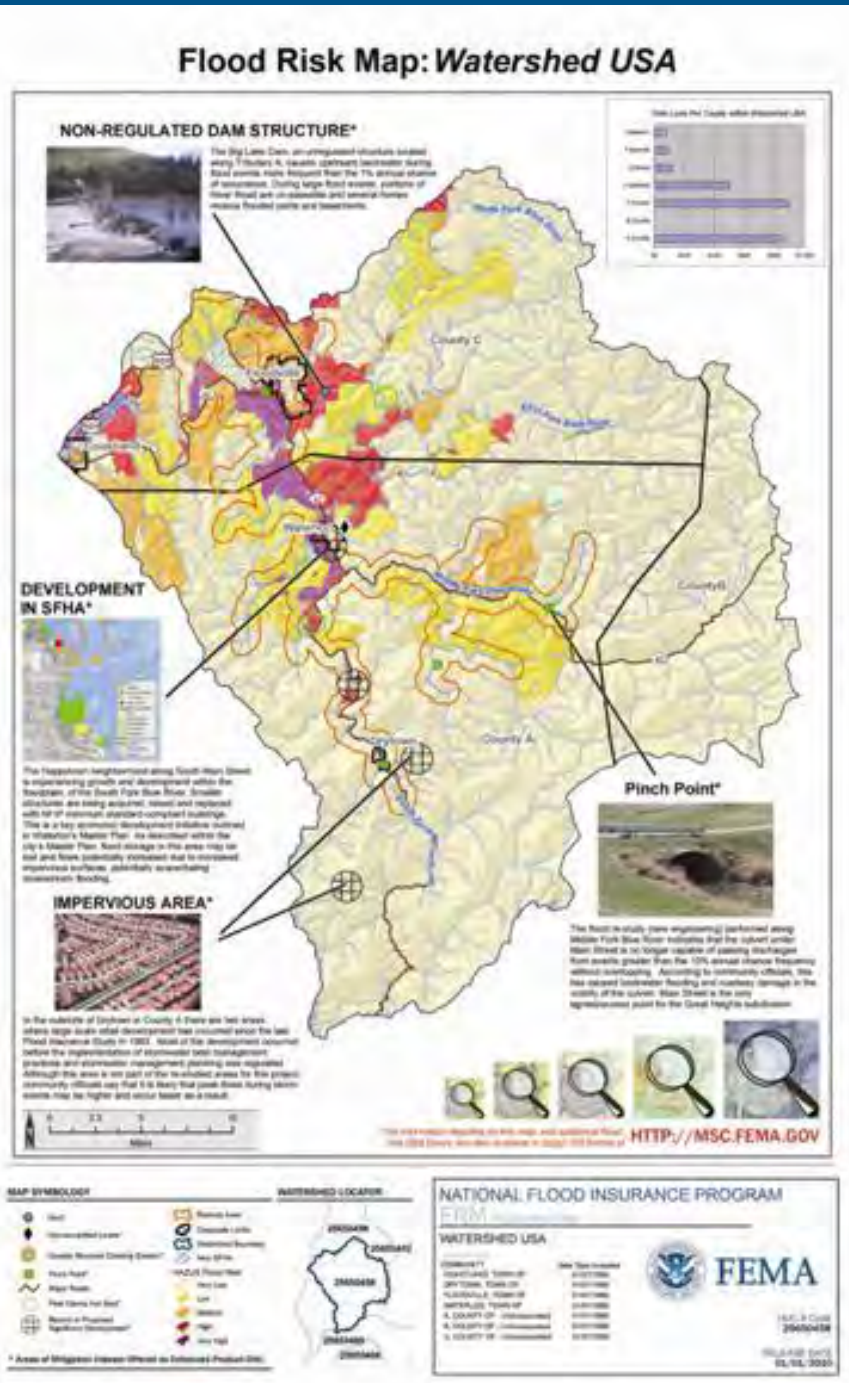
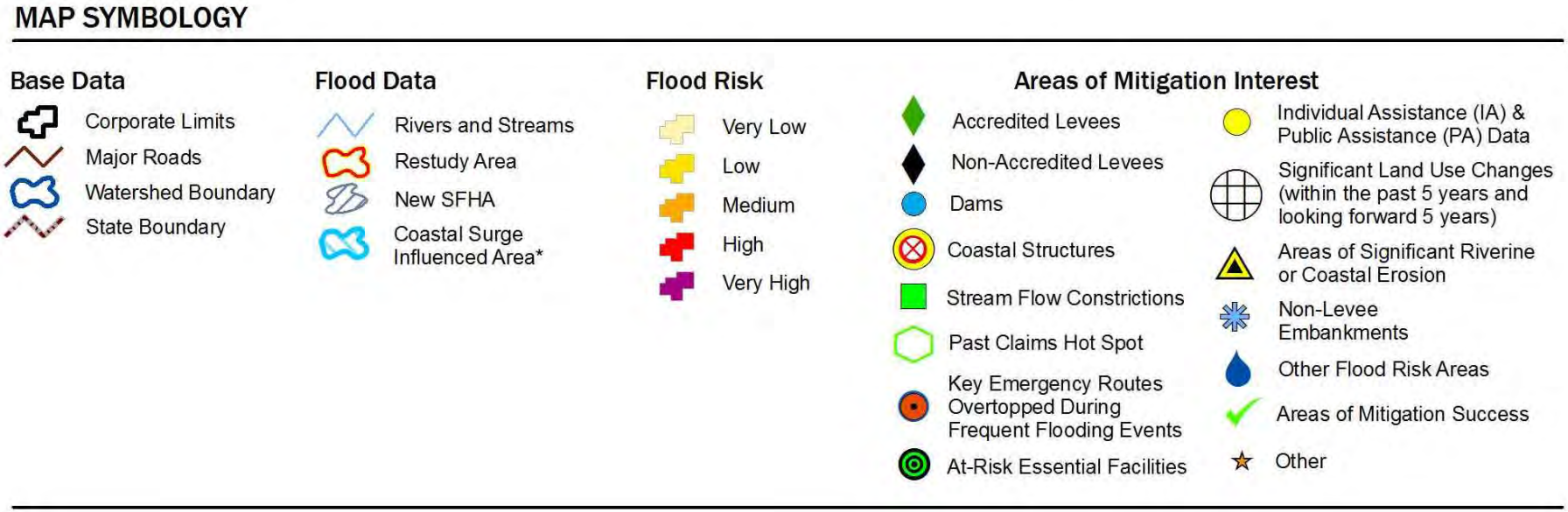
Flood Risk Map

- **Visually Promotes Risk Awareness**
  - Contains results of Risk MAP project non-regulatory datasets
  - Promotes additional flood risk data not shown but located within the Flood Risk Database



Flood Risk Map



Project Timeline

This project timeline has changed and is no longer applicable. See main project web page for latest information.
www.Loudoun.gov\floodmapping

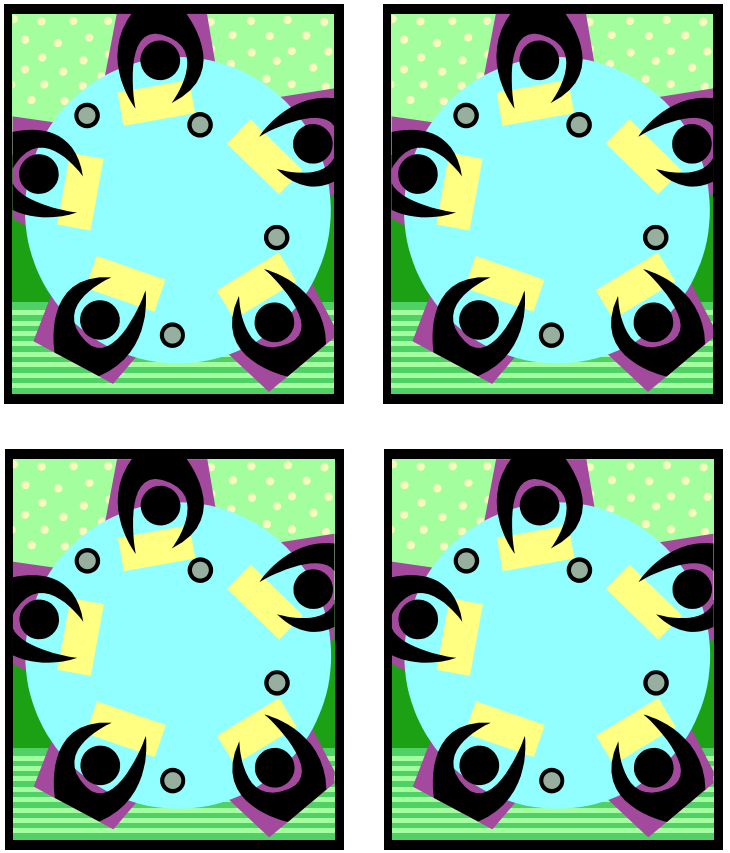
- 3/13: Flood Risk Review (FRR) meeting with County Staff
- 3/24 – 4/4: FRR meeting with Town of Leesburg
- 3/24 – 4/4: FRR meeting with Towns other than Leesburg
- Mid/Late April: Preliminary FIS/FIRM issued
- Early/Mid May: Community Consultation Officer (CCO) meeting
- Late May: Public Open House for Eastern Loudoun
- Late May: Public Open House for Western Loudoun
- Late May/Early June 2014: Begin statutory 90-appeal period
- Fall 2014: Resolve any appeals received
- Winter 2014/2015: Issue Letter of Final Determination
- Spring/Summer 2015: FIS/FIRM adopted and effective
- Summer 2015: Resilience Meetings

Note: Timeline dates were best estimate at time of presentation and some have changed.

Try the Products and Datasets

Visit the workstations to review:

- **Flood Risk MAP**
- **Flood Risk Report**
- **Flood Risk Database**
- **Flood Depth and Analysis Grids**

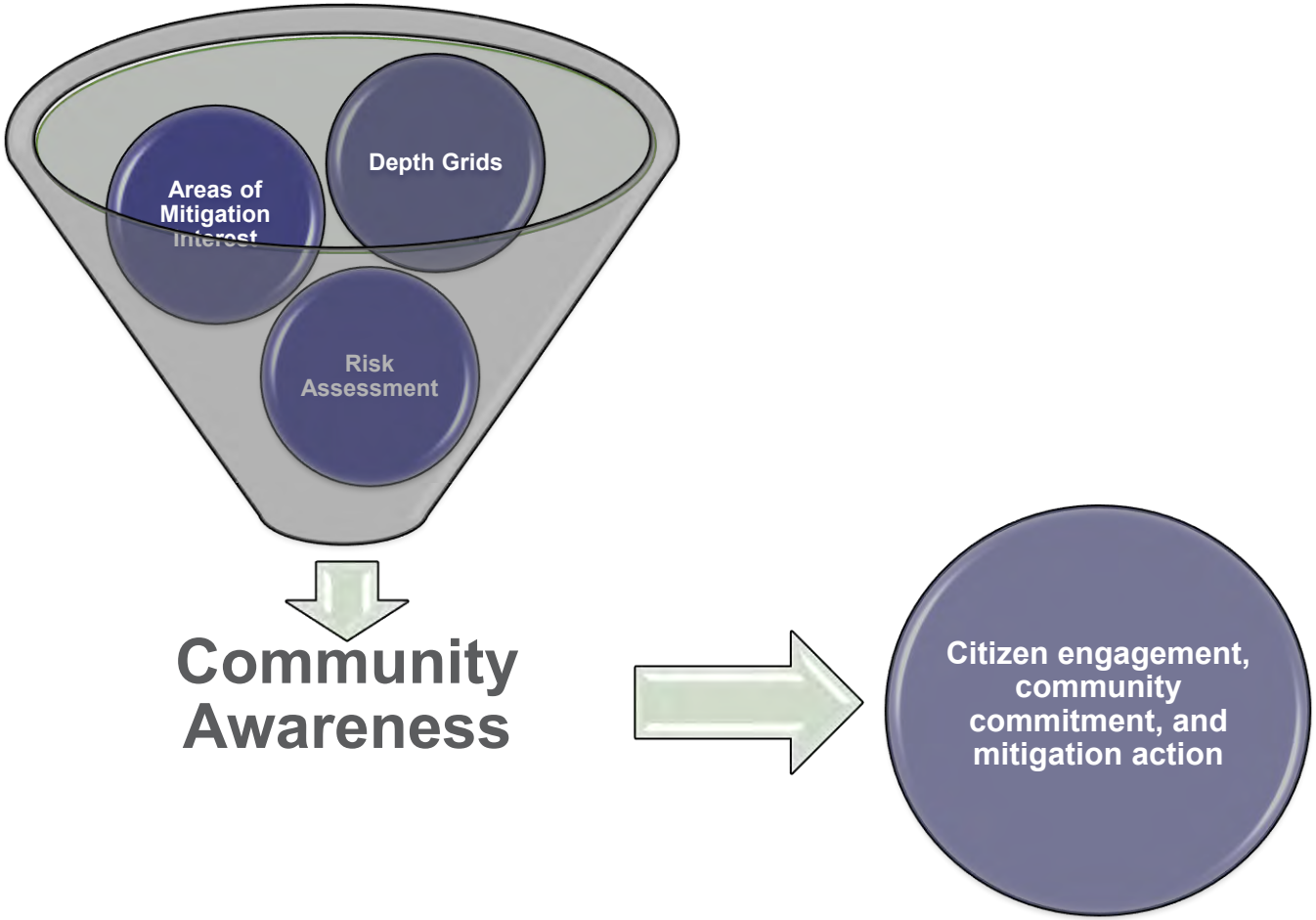


Communicating about Flood Risk

- **Citizens expect to hear about flood risk from their local officials more than any other source***
- **By sharing flood risk information with them, they can:**
  - Take action to protect themselves, their families, and businesses
  - Improve your community's resilience to flooding
  - Support implementation of your mitigation plan
- **Review the "Communications Guide" for ideas of how to use these products to communicate risk**

*** From 2010 FEMA Risk MAP Flood Risk Awareness Survey**

Risk MAP Tools Help Communicate Risk



Next Steps

- **Review and finalize the analyses and assessments**
- **Begin communicating about flood risk**
- **Inform mitigation planning efforts underway**
- **Begin identifying appropriate mitigation actions**

Thanks for participating! We'll be talking again soon.